REMARKS

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/31710 (Weber et al.) in view of GB 2262527 (Bujara et al.) Applicants traverse the rejection for lack of prima facie case because the record fails to fully consider the difference between the prior art and the claims.

When the difference is properly considered, it becomes quite clear that there is no basis in the prior art for modification to the claims with a reasonable expectation of success. More specifically, when one considers the claimed inventions distinctive feature of contacting, in a high rotational speed gas jet impact mill, the feed composition with a superheated gas mixture selected from (i) a superheated gaseous mixture of steam and an inert gas, and (ii) a superheated gas mixture of steam and air. Nothing of record teaches or suggests modification of the prior art to the claims reciting specified composition of the superheated gaseous mixture.

To establish the patentable distinction of the claims over the prior art, Applicants present hereunder a summary of the invention, a statement of the rejection and how the claims avoid or overcome the rejections.

Summary of the Invention

The present invention relates to a process for producing particulate water-soluble cellulose derivatives, comprising:

a) forming a feed composition comprising a cellulose derivative (e.g., being present in an amount of 20 wt. % to 50 wt. %, based on the total weight of the feed composition) and 50 wt. % to 80 wt. % of water, based on the total weight of the feed composition, wherein the cellulose derivative is at least one of swelled and dissolved in the feed composition;

b) contacting, in a high rotational speed gas jet impact mill, the feed composition with a superheated gas mixture selected from (i) a superheated gaseous mixture of steam and an inert gas, and (ii) a superheated gas mixture of steam and air, (thus converting at least a

portion of the water of the feed composition into the vapor phase), thereby converting the cellulose derivative of the feed composition into a solid state form of finely particulate particles, wherein the superheated gas mixture has a steam content of 40 wt. % to 99 wt. %, based on the total weight of the superheated gas mixture;

c) separating the particulate cellulose derivative from the superheated gas mixture; and

d) optionally drying the particulate cellulose derivative.

It has been found that the solid particles of the cellulose derivatives, produced using the process of the present invention, have a high bulk density combined with a good flowability, and that the proportion of fines in the product is very low. There is no decrease, or only a minimal decrease, in viscosity compared to the starting products. It was also found that the overall energy requirement of the process is reduced or virtually unchanged compared to the processes of the prior art, and since the heat exchange gas consists of a superheated steam/inert gas mixture or steam/air mixture, the energy used for the grinding is recovered in the form of thermal energy, in the heat exchange gas and can thus be utilized or preferably converted into other forms of energy. It was also surprisingly found that no films or agglomerations are formed in the grinding plant and the maintenance expenditure is thus low.

Statement of the Rejection:

The rejection is based on the grounds that:

> "WO 98/31710 teaches of a process of forming a finely divided polysaccharide derivative of cellulose by gelling a cellulose ether between 35 to 99 wt. % of water. WO 98/31710 also teaches that the dissolved cellulose derivative is then converted into the solid state in various state of the art ways, such as with a dryer-pulveriser or steam mill drying, (see page 8, lines 11-22 of the translation). WO 98/31710 also disclose of suitable solvents, namely water and hydrocarbons and halogenated hydrocarbons, (see page 7, lines 1-6 and page 9, lines 1-8 of the translation). WO 98/31710 also teach of ranges of the superheated solvent, (see page 7, lines 28-32). WO 98/31710 next teaches that of further separation steps to obtain a polysaccharide derivative that have a high bulk density accompanied by good flow properties, (see page 4, lines 22-31)." (Delineation is Applicants' to emphasize distinction from the claims).

Bujara et al. is cited for the proposition that:

> "[it] also disclose of a process of generating water-soluble cellulose derivatives of particulate size, (see page Example 1)."

Hence the Examiner concluded that:

> "One having ordinary skill in the art would have been motivated to utilize a variety of mill processes as generically taught by WO 98/31710 and further explicitly taught by Bujara et al. Accordingly, it would have been obvious to the skilled artisan to substitute the impact mill of Bujara et al. for the process of WO 98/31710, especially when WO 98/31710 teaches the utilization of a variety of mill processes that can be employed for the production of finely particulate cellulose derivatives."

Statement of How the Claims Avoid or Overcome the Rejection.

At the outset, Applicants submit that the difference between the claims and the prior art, with particular reference to the main distinguishing feature of the specified composition of the superheated gas, has not been taken into consideration.

While the Examiner is correct in stating that the production of the starting product to be mill dried (the feed composition) is described, and that the production of such a "feed composition" is already described in WO 98/31710, it is, Examiner however, incorrect to state that WO 98/31710 describes the "ranges of superheated solvent". To be sure, at the cited page (page 7, lines 28-32) WO 98/31710 describes the solvents which are used for dissolving or swelling. However, it does not teach or suggest the composition of the drying gas.

In contrast, the claimed invention as recited in section b) of claim 1, recites that in the mill drying of the "feed composition" there is employed "a superheated gas mixture selected *from* (i) a superheated gaseous mixture of steam and an inert gas and (ii) a superheated gas mixture of steam and air".

In the above regard, it is worth noting that the gas compositions described in this claim relate to the gas employed for drying and transportation and not to the solvent used for swelling the "feed composition".

From the foregoing, it is Applicants' submission that WO 98/31710 neither teaches nor suggests the composition of the drying gas recited by the claims.

In addition to the above, Applicants reiterate their arguments of record which are essentially as follows:

The distinct feature of the claims relates to the use of a steam/inert gas or steam/air mixture having a content of steam of 40-99% by weight, and in particular a content of steam of 70-95% by weight. This content of steam is maintained by a method of procedure using circulating gas and is adjusted by introducing specific quantities of inert gas or air.

In Bujara only an incidental comment is made concerning the transporting gas. That is: "... the cellulose compound is preferably conveyed by a gas stream such as air": the examples also only mention "air flow" or "air temperature". In point of fact, Bujara makes no mention of the composition of the transporting gas, and certainly makes no mention of the possibility of using a content of steam in the transporting gas for the purpose of drying. From Bujara's general disclosure of the use of "... gas stream, such as air ..." the skilled artisan would assume that gases referred to would have a dew point similar to that of air, such as, for example, nitrogen. The skilled artisan could not therefore assume from Bujara that it is advantageous to use a superheated gas mixture like a steam/inert gas or steam/air mixture as a transporting gas. The use of steam/inert gas or steam/air mixtures as the transporting gas according to claims produces, in particular, products with finer particles and a higher bulk density than the use of air or nitrogen according to Bujara. Moreover, the products according to the claims have a particularly low content of particles of < 15µm. The contents of steam of the claimed invention can only be adjusted economically if a circulating gas procedure is used. Such a circulating gas procedure is not described in Bujara.

Also, the apparatus described in Bujara does not suggest that a circulating gas procedure is used. The procedure using steam mixtures as the transporting gas is

particularly advantageous in relation to energy consumption and the operational safety is also high.

For the sake of completeness, Applicants further address the Examiner's position in paragraph 8 of the Office Action about the feed composition, its gelation and the mill used for combination. While the Examiner is correct in stating that that all types of mills can be used in the various processes, the composition of the drying gas is, however, independent of the type of mill. Therefore, the use of various types of mills is not anticipatory or suggestive of the claims.

In view of the foregoing, Applicants submit that the record does not suggest a prima facie case of obviousness. Applicants therefore pray for the allowance of the claims in the application.

Respectfully submitted,

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